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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,910	02/09/2004	Patrick G. Smith	214-001US1	8778
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ALLISON JOHNSON, P.A. LAKE CALHOUN EXECUTIVE CENTER 3033 EXCELSIOR BLVD., SUITE 467 MINNEAPOLIS, MN 55416			EXAMINER ROSENBERGER, FREDERICK F	
			ART UNIT	PAPER NUMBER
			2884	

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/774,910	Applicant(s) SMITH, PATRICK G.	
	Examiner Frederick F. Rosenberger	Art Unit 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-31 is/are allowed.
- 6) ☒ Claim(s) 1 and 9-20 is/are rejected.
- 7) ☒ Claim(s) 2-8 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 May 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/9/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Preliminary Amendment, filed 5/21/2004, has been received and entered. Accordingly, minor changes have been made to the specification and new formal drawings have been entered.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **108** (page 15, line 22).
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "**106**" has been used to designate both a component (page 15, line 21) and a sample chamber (page 15, line 25; Figure 5).
4. The drawings are objected to because Figure 1 shows a graph of absorption versus wavelength (l) but in the specifications the graph is referred to as a graph of absorption versus optical path length (page 2, line 4).
5. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

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number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

7. The disclosure is objected to because of the following informalities:

Page 2, line 2: "in with" should be --in--.

Page 11, line 8, "eliminated" should be --eliminate--.

Page 15, line 20, the period after "structure" should be deleted.

Appropriate correction is required.

Claim Objections

8. Claims 2-12 are objected to because of the following informalities:

In claim 2, line 2, "said two analytical detectors" should be --said at least two analytical detectors-- to establish proper antecedent basis in claim 1.

In claim 2, line 2, "the signals detected" should be --said output signals provided-- to establish proper antecedent basis.

In claim 3, line 1 and claim 9, line 2, "said analytical detectors" should be -
-said at least two analytical detectors-- to establish proper antecedent basis in claim 1.

In claims 4-8, line 1, "said summing means" should be --said means for summing-- to establish proper antecedent basis.

In claims 10-12, line 1, "the source" or "said source" should be --said at least one source-- to establish proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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10. Claims 1 and 10-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yelderman et al. (US Patent # 5,095,913).

Yelderman et al. disclose a method and apparatus for gas detection comprising:

An IR source **40** (Figure 2);

Four analytical detectors, wherein two analytical detectors **12, 14** of the four analytical detectors are configured to provide an output signal indicative of a first gas of interest and the other two analytical detectors **32, 34** are configured to provide an output signal indicative of a second gas of interest (column 10, lines 35-52);

Two reference detectors **22, 24** configured to provide an output signal independent of a first gas of interest (column 10, lines 36-39);

And a region **58** for a gas stream to be analyzed wherein an optical path is provided from the source **40** to the detectors.

Although Yelderman et al. don't specifically disclose a sample chamber, Yelderman et al. do allow for the region **58** to include a tube for containing the gas flow (column 10, lines 24-35). It would have been obvious to one of ordinary skill in the art that such a configuration proposed by Yelderman et al. would comprise a sample chamber for gas measurement.

With regards to claims 10-12, Yelderman et al. only generally discloses a single IR source, but not the type of the source. However, heated filaments, black body radiators, LEDs, and incandescent lamps are all well-known equivalent sources for IR illumination (for example, Mottier et al. (US Patent # 6,545,278) discloses an

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incandescent source). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a heated filament, a blackbody radiator, an LED, or an incandescent lamp for the IR source, since the examiner takes Official Notice of the equivalence of the IR sources for their use in IR illumination and the selection of any of these known equivalents as an IR source for illumination of a gas of interest would be within the level of ordinary skill in the art.

With regards to claims 16, Yelderman et al. disclose a filter **60** adjacent the two analytical detectors **12, 14** wherein the filter has been configured to transmit IR radiation in a first band of wavelengths corresponding to wavelengths absorbed by a first gas of interest (column 6, lines 20-22).

With regards to claim 17, Yelderman et al. disclose a filter **62** adjacent the other two analytical detectors **32, 34** wherein the filter has been configured to transmit IR radiation in a second band of wavelengths corresponding to wavelengths absorbed by a second gas of interest (column 8, lines 28-32).

With regards to claim 18, Yelderman et al. disclose a filter **61** adjacent the two reference detectors **22, 24** wherein the filter has been configured to transmit IR radiation in a third band of wavelengths corresponding to wavelengths not absorbed by a first gas of interest (column 6, lines 23-25).

With regards to claim 19, Yelderman et al. disclose that a host processing system, which is analogous to a microprocessor, determines the concentration of the gases of interest.

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11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yelderman et al., as applied to claim 1 above, and further in view of Uno et al. (US Patent # 5,429,805).

Yelderman et al. disclose all the limitations of claim 1, as addressed above. However, Yelderman et al. only generally discloses the use of a bandpass filter **60** between the source and the analytical detector. Yelderman et al. makes no mention that said bandpass filter comprises an interference filter.

However, it is widely known in the art that interference filters are often used as bandpass filters in IR sensing applications. For example, Uno et al. teach the use of several bandpass filters **7B** for restricting the detection range of a set of detectors **7A** in an IR gas sensing application (Figures 1 and 2). Uno et al. further teaches that in the prior art, it is common for the bandpass filters **7B** to comprise a multi-layered thin film interference filter (column 1, lines 31-39).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to use interference filters for the bandpass filter, since it was known in the art that interference filters are used to narrow the detection range of detectors in IR gas sensors, as taught by Uno et al.

Allowable Subject Matter

12. Claims 22-31 are allowed.

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13. Claims 2-8 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

Claims 2, 21, 22, and 28 are directed towards a gas detector and method for gas detection employing at least two analytical detectors, wherein each analytical detector provides an output signal indicative of a first gas of interest and wherein the output signals provided by the analytical detectors are summed. While the prior art does teach the use of two analytical detectors in the detection of a single gas of interest (see, for example, Tacke et al. (US Patent # 6,555,820), McVey (US Patent # 6,875,399), and Paz (US Patent # 5,515,859)), prior art systems primarily rely on comparison (Paz), spectrum coverage (Tacke et al.; McVey), or subtraction (Yelderman et al.) of the output signals of the analytical detectors. As the prior art fails to teach or reasonably suggest summing the output signals from the analytical detectors, wherein the detectors have been configured to provide output signals indicative of a first gas of interest, applicant's disclosure provides a novel and nonobvious improvement over the prior art.

Accordingly, the present claims would be allowable. Claims 3-8, 23-27, and 29-31 would be allowable based on their dependency from claims 2, 22, and 28.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick F. Rosenberger whose telephone number is 571-272-6107. The examiner can normally be reached on Monday-Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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